Crop preference of rodents at Ludhiana[1]

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Rodents are the most destructive vertebrate pests of field crops in the Punjab. The loss from rodents to wheat, groundnut and sugarcane crops were reported by Bindra & Prem Sagar (1968). However, relatively little is known about the preference of different species for different field crops.

MATERIALS AND METHODS

Capture, mark, release and recapture method (Davis 1964) using 2 types of wonder traps (Deoras et al. 1969) to avoid cannibalism was employed. In one type, the entrance was only 4 × 2 cm, so that *Bandicota bengalensis* (Gray) and *Tatera indica* (Hardwicke) could not enter, and the pressing-disc was so adjusted that the animal weighing as little as 5 gm could enter. In the other type, the pressing disc was so adjusted that the animals weighing less than 20 gm could not enter. A mixture of husked rice, *bajra* (Pearl-millet) and wheat was used as bait. The traps were laid in different crops at a distance of 100 m from one another in a 53 ha cultivated area of the Punjab Agricultural University Farm, Ludhiana. This study was conducted during December 1970 to November 1972 for a 10-day period in the first fortnight of each month. month.

The preference was determined by using the following preference categories.

Categories of crop preference based on the number of specimens per species per trap per day (x 10^3).

Species	Highly preferred	Moderately preferred	Less preferred
Mus musculus bactrianus Blyth	200-650	100-199	0-99
Mus booduga (Gray)	100-450	10-99	0-9
Rattus meltada (Gray)	100-650	10-99	0-9
Tatera indica (Hardwicke)	100-158	10-99	0-9
Total	600-975	300-599	0-299

RESULTS AND DISCUSSION

The observed preferences by different species are given in Table 1, and are discussed below briefly.

Species	Season	Highly preferred	Moderately preferred	Less preferred
Mus musculus bactrianus	*Rabi*	Fenugreek, Potato, radish, spinach and tomato.	Barley, *sarson* and *sarson* + Egyptian clover	*Ber* orchard, cauliflower, Egyptian clover, lentil, lucerne, oat, pea, *toria* and wheat.
	Kharif	Fodder, groundnut and sugarcane.	Brinjal, cluster-bean, cow-pea, *desi* cotton, *jantar*, pearl-millet, sorghum and soybean.	American cotton, bitter-gourd, bottle-gourd, carrot (seed), chickory, citrus orchard, green-gram, *kaahi*, mango orchard, maize, musk-melon, Napier-*bajra* hybrid, onion (seed), pigeon-pea, squash-melon sweet-potato, turmeric and water-melon.
Mus booduga	*Rabi*	Radish and *sarson* + Egyptian clover.	potato, tomato, *toria*, Fenugreek, lentil, oat, and wheat.	Barley, *ber* orchard, cauliflower, Egyptian clover, lucerne, pea, *sarson* and spinach.

Species	Season	Highly preferred	Moderately preferred	Less preferred
	Kharif	Groundnut.	American cotton, Citrus orchard, chickory, cluster-bean, *desi* cotton, fodder, green-gram, *jantar*, maize, mango orchard, musk-melon, pearl-millet, sorghum, soybean and sugarcane.	Bitter-gourd, bottle-gourd, brinjal, cow-pea, *kaahi*, Napier-*bajra* hybrid, onion (seed), pigeon-pea, squash-melon, sweet-potato, turmeric and water-melon.
Rattus meltada	*Rabi*	Cauliflower and onion.	*Ber* orchard, Egyptian clover, lentil, oat, potato, *sarson*, *sarson* + Egyptian clover, tomato, and wheat.	Barley, fenugreek, *metha*, pea, radish, spinach, and *toria*.
	Kharif	cow-pea, fodder, ground-nut, pearl-millet, and soybean.	American cotton, bitter-gourd, black-gram, bottle-gourd, brinjal, citrus orchard, cluster-bean, *desi* cotton, green-gram, *jantar*, maize, mango orchard, musk-melon, Na-pier-*bajra* hybrid, pigeon-pea, radish (seed), sorghum, sugarcane, sweet-potato and water-melon.	carrot (seed), chickory, *kaahi*, okra, onion (seed), squash-melon, and turmeric.

Species	Season	Highly preferred	Moderately preferred	Less preferred
Tatera indica	Rabi	Metha	Lentil, onion, sarson and toria.	Barley, ber orchard, Egyptian clover, lucerne, oat, potato, sarson + Egyptian clover, tomato and wheat.
	Kharif	Brinjal	American cotton, chickory, cluster-bean, desi cotton, fodder, greengram, jantar, maize, Napier-bajra hybrid, okra, pearl-millet and sorghum.	Black-gram, bottle-gourd, citrus orchard, mango orchard, muskmelon, squash-melon, pigeon-pea, radish (ssed), soybean, sugarcane, sweet-potato and water-melon.

TABLE 1

CROP PREFERENCE BY DIFFERENT SPECIES OF RODENTS DURING DECEMBER 1970-NOVEMBER 1972 ON THE PAU FARM, LUDHIANA

Crop	Number of rodents per trap per day (x 10^3)							Total
	M.m.b.	M.b.	M.p.	R.m.	B.b.	G.e.	T.i.	
1	2	3	4	5	6	7	8	9
CEREALS								
Barley	100(1+1)	0(1+1)	0(2+2)	1(2+2)	0(1+1)	0(2+2)	0(1+1)	101
Oat	58(3+1)	17(3+1)	39(9+3)	64(9+3)	0(6+2)	0(9+3)	4(6+2)	182
Maize	59(9+9)	16(9+9)	1(21+21)	34(21+21)	4(12+12)	0(21+21)	21(12+12)	135
Pearl-millet	186(3+1)	14(3+1)	5(5+6)	140(5+6)	0(2+5)	0(5+6)	12(2+5)	357
Wheat	86(15+15)	20(15+15)	1(38+39)	35(38+39)	5(23+24)	1(38+39)	6(23+24)	154
PULSES								
Black-gram	0(0+0)	0(0+0)	0(1+0)	67(1+0)	0(1+0)	0(1+0)	0(1+0)	67
Green-gram	89(3+3)	28(3+3)	0(6+6)	86(6+6)	0(3+3)	0(6+6)	11(3+3)	214
Lentil	22(0+1)	67(0+1)	0(0+2)	11(0+2)	0(0+1)	0(0+2)	22(0+1)	122
Pigeon-pea	13(3+3)	0(3+3)	1(8+8)	25(8+8)	0(5+5)	0(8+8)	0(5+5)	39
Soybean	100(1+0)	33(1+0)	0(3+0)	178(3+0)	0(2+0)	0(3+0)	0(2+0)	311
OILSEEDS								
Groundnut	300(1+0)	450(1+0)	25(1+0)	200(1+0)	0(0+0)	0(1+0)	0(0+0)	975
Sarson	100(1+1)	0(1+1)	0(3+3)	16(3+3)	0(2+2)	0(3+3)	39(2+2)	155
Toria	67(1+1)	17(1+1)	0(3+3)	6(3+3)	0(2+2)	0(3+3)	17(2+2)	107

M.m.b. = Mus musculus bactrianus, M.b. = Mus booduga, M.p. = Mus platythrix, R.m. = Rattus meltada, B.b. = Bandicota bengalensis, G.e. = Golunda ellioti, T.i. = Tatera indica.

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TABLE 1 (contd.)

Crop	M.m.b.	M.b.	M.p.	R.m.	B.b.	G.e.	T.i.	Total
1	2	3	4	5	6	7	8	9
SUGAR CROPS								
Sugarcane	252(2+2)	27(2+2)	1(4+4)	63(4+4)	14(2+2)	6(4+4)	0(2+2)	368
Sweet-potato	80(1+0)	0(1+0)	0(3+1)	35(3+1)	7(2+1)	0(3+1)	7(2+1)	129
FODDER								
Cow-pea	100(1+0)	0(1+0)	0(1+0)	650(1+0)	0(0+0)	0(1+0)	0(0+0)	750
Egyptian clover	56(0+4)	6(0+4)	4(0+7)	29(0+7)	0(0+3)	0(0+7)	0(0+3)	95
Lucerne	57(3+2)	7(3+2)	0(5+5)	45(5+5)	5(3+2)	13(5+5)	2(3+2)	129
Napier-bajra hybrid Sarson +	48(2+3)	4(2+3)	6(4+6)	45(4+6)	10(2+3)	5(4+6)	44(2+3)	162
Egyptian clover	188(0+4)	150(0+4)	71(0+7)	71(0+7)	0(0+3)	0(0+7)	0(0+3)	480
Sorghum	175(1+0)	75(1+0)	25(3+0)	92(3+0)	25(2+0)	0(3+0)	13(2+0)	405
Fodder*	358(5+5)	58(5+5)	44(11+11)	105(11+11)	21(6+6)	7(11+11)	40(6+6)	633
SUMMER VEGETABLES								
Bitter-gourd	25(1+1)	0(1+1)	0(1+1)	25(1+1)	0(0+0)	0(1+1)	0(0+0)	50
Bottle-gourd	86(2+2)	0(2+2)	0(3+3)	33(3+3)	14(1+1)	0(3+3)	0(1+1)	133
Brinjal	152(3+4)	5(3+4)	0(5+6)	42(5+6)	0(2+2)	0(5+6)	158(2+2)	357
Musk-melon	50(2+2)	25(2+2)	0(3+3)	17(3+3)	17(1+1)	0(3+3)	0(1+1)	109
Okra	0(0+0)	0(0+0)	0(2+2)	8(2+2)	0(2+2)	0(2+2)	50(2+2)	58
Squash-melon	50(0+1)	0(0+1)	0(1+1)	0(1+1)	50(0+1)	0(1+1)	0(0+1)	100

*(mixture of pearl-millet, cow-pea, cluster-bean and sorghum)

TABLE 1 (contd.)

Crop 1	M.m.b. 2	M.b. 3	M.p. 4	R.m. 5	B.b. 6	G.e. 7	T.i. 8	Total 9
Water-melon	88(2+2)	0(2+2)	0(3+3)	58(3+3)	0(1+1)	0(3+3)	0(1+1)	146
WINTER VEGETABLES								
Cauliflower	0(1+1)	0(1+1)	0(1+1)	183(1+1)	0(0+0)	0(1+1)	0(0+0)	183
Carrot (seed)	25(1+1)	0(1+1)	0(1+1)	0(1+1)	0(0+0)	0(1+1)	0(0+0)	25
Fenugreek	550(0+1)	50(0+1)	0(0+1)	0(0+1)	0(0+0)	0(0+1)	0(0+0)	600
Onion	0(0+0)	0(0+0)	0(1+1)	117(1+1)	0(1+1)	0(1+1)	17(1+1)	134
Onion (seed)	25(1+1)	0(1+1)	0(1+1)	0(1+1)	0(0+0)	0(1+1)	0(0+0)	25
Metha	0(0+0)	0(0+0)	0(1+0)	0(1+0)	0(0+1)	0(1+0)	100(0+1)	100
Pea	50(1+0)	0(1+0)	0(1+0)	0(1+0)	0(0+0)	0(1+0)	0(0+0)	50
Potato	340(1+1)	20(1+1)	0(3+3)	87(3+3)	0(2+2)	0(3+3)	0(2+2)	447
Radish	650(1+0)	300(1+0)	0(1+0)	0(1+0)	0(0+0)	0(1+0)	0(0+0)	950
Radish (seed)	0(0+0)	0(0+0)	0(1+0)	67(1+0)	0(1+0)	0(1+0)	0(1+0)	67
Spinach	200(1+0)	0(1+0)	0(1+0)	0(1+0)	0(0+0)	0(1+0)	0(0+0)	200
Tomato	248(4+3)	57(4+3)	3(6+5)	73(6+5)	0(2+2)	0(6+5)	8(2+2)	389
FRUIT TREES								
Ber	17(3+3)	3(3+3)	1(9+9)	14(9+9)	0(3+3)	0(9+9)	0(3+3)	35
Citrus	51(6+6)	24(6+6)	7(9+9)	40(9+9)	0(3+3)	0(9+9)	1(3+3)	123
Mango	50(3+3)	24(3+3)	6(9+9)	54(9+9)	6(6+6)	1(9+9)	1(6+6)	142
MISCELLANEOUS								
Americon cotton	24(3+3)	38(3+3)	1(8+8)	18(8+8)	0(5+5)	0(8+8)	13(5+5)	94
Desi cotton	150(1+1)	42(1+1)	25(2+2)	75(2+2)	0(1+1)	0(2+2)	67(1+1)	359
Cluster-bean	147(6+4)	90(6+4)	7(12+8)	93(12+8)	3(6+4)	0(12+8)	10(6+4)	350

TABLE 1 (contd.)

Crop 1	M.m.b. 2	M.b. 3	M.p. 4	R.m. 5	B.b. 6	G.e. 7	T.i. 8	Total 9
Jantar	144(3+0)	22(3+0)	11(5+1)	33(5+1)	11(2+1)	0(5+1)	33(2+1)	254
Chickory	67(1+0)	33(1+0)	0(2+0)	0(2+0)	0(1+0)	0(2+0)	33(1+0)	133
Kaahi	33(1+0)	0(1+0)	0(1+0)	0(1+0)	0(0+0)	0(1+0)	0(0+0)	33
Turmeric	3(0+1)	0(0+1)	0(0+1)	0(0+1)	0(0+0)	0(0+1)	0(0+0)	3
After harvesting of different crops*	16	0	1	10	1	0	0	
Ploughed fields before sowing*	34	32	0	44	0	0	20	

Parentheses are the number of traps used during December 1970-November 1971 and those during December 1971-November 1972.

* Total number of rodents trapped.

The pooled data of all the species of rodents shows their preference for cow-pea, fenugreek, fodder (mixture of pearl-millet, cow-pea, cluster-bean and sorghum), groundnut and radish, and followed by brinjal, cluster-bean, *desi* cotton, pearl-millet, potato, *sarson* + Egyptian clover, sorghum, soybean, sugarcane and tomato than the other crops (Table 1).

All the species, except *Tatera*, were found more in the closely-spaced crops. This difference might be due to the hopping type of movements of *Tatera*.

The frequent tillage operations that caused lack of weeds and dis-
However the rodents were found in a variety of crops, but the num-
turbed the habitat during early stages of growth of vegetables could explain the lower incidence of rodents during early stages than during later stages. Also, in fodder crops, absence of tillage operations might be responsible for the high incidence of rodents.
bers in which they were observed in different crops suggest that they exhibit preference for different crops. For instance, *Rattus* preferred onion, cauliflower and soybean; *M. booduga* preferred groundnut and radish; *M. m. bactrianus* preferred fenugreek, radish, spinach, tomato and potato; *M. platythrix* preferred oats; *Bandicota* preferred bottle-gourd, musk-melon, squash-melon, lucerne and wheat; *Golunda* preferred lucerne and *Tatera* preferred *metha* and brinjal. It would be desirable to examine as to whether these preferences are on the basis of the olfactory or gustatory stimuli presented by the crops.

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